Roadside Vegetation Field Condition Study

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DISCLAIMER

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation.

METRIC CONVERSION TABLE

SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL
LENGTH				
ft	feet	0.305	meters	m

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL
AREA				
ac	acres	0.405	hectares	ha

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL
MASS				
lb	pounds	0.454	kilograms	kg

TECHNICAL REPORT DOCUMENTATION

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16. Abstract

It was questioned whether the use of herbicides would improve MRP turf scores by controlling undesirable broadleaf weeds. Plots were established in North and South Florida on areas that the Project Manager determined would fail to meet MRP standards due to weed pressure. These areas were treated in 2010 and 2011 with aminopyralid and triclopyr, two herbicides proven to be effective on the weed spectrum present. Spanish needles was the dominate weed at both locations. The herbicide application provided highly effective control of Spanish needles and other broadleaf weeds. In the absence of weed pressure, the desirable perennial grasses began to expand and cover these void areas. It was determined by the Project Manager that though these areas initially failed to meet MRP standards, they did meet standards after the herbicide applications.

17. Key Word	18. Distribution Statement
Maintenance Rating Program (MRP), aminopyralid, triclopyr amine, herbicide	No restrictions.

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INTRODUCTION

It is important that highway rights-of-ways be covered with perennial grasses to stabilize the slope in order to maintain the integrity of the driving surface. This is of such importance that DOT personnel randomly check highways throughout the state to ensure that proper grass cover is present and that weed growth is not excessive. The current method to determine the quality of right-of-way vegetation is with the Maintenance Rating Program (MRP) rating scale.

The University of Florida is recommending the use of herbicides to manage weeds and promote perennial grasses. It is believed that these procedures can reduce overall maintenance costs while increasing turf cover. However, the level of improvement, or decline, of grass cover as a result of implementing these recommendations has not been documented. Additionally, Florida is a large state with many different climactic and soil conditions as one moves from North to South. These differences lead to variety of weed species that occur in one location, but not in another. It is unknown if a herbicide program implemented in one part of the state would be equally effective in other parts.

OBJECTIVES

Field studies were implemented in two locations to demonstrate and document the latest best management practices recommended by the University of Florida and the resulting change in turf cover. Two field experiments were established in Alachua and Hardee County on 7/30/10 and 9/20/10, respectively. The treated area consisted of three distinct plots measuring 100 ft in length and 20 ft (10 ft in Hardee) in width; a 50 ft non-treated area was left between each treated plot. Each plot was sprayed with aminopyralid and triclopyr amine at 0.08 lb active ingredient (ai)/ac and 0.375 lb ai/ac, respectively. This same herbicide mix was used again at both locations on 4/15/11 (Alachua) and 5/9/11 (Hardee). After application, the sites were regularly followed to determine overall weed control and grass cover.

DISCUSSION

Alachua County

Prior to application, the dominant perennial grasses were bahiagrass (*Paspalum notatum*) and bermudagrass (*Cynadon dactylon*) and the weed species present were Spanish needles (*Bidens alba*), matchweed (*Lippia nodiflora*) and dogfennel (*Eupatorium capillifolium*). Spanish needles was the most common species covering approximately 50% of the area, followed by matchweed (30% cover) and dogfennel (5% cover). The desirable perennial grasses at this location were bahiagrass (30% cover) and bermudagrass (10% cover).

After the application on 7/30/10, percent cover of Spanish needles, matchweed, and dogfennel were reduced to 0%. Of these three weeds, Spanish needles will commonly germinate from seed

quickly after a herbicide is applied and reinfest the area. However, the soil residual activity of aminopyralid prevented germination and establishment of Spanish needles seedlings and no other broadleaf weeds filled these void areas. The application site remained free of broadleaf weeds until the desirable perennial grasses entered dormancy due to frost.

In the spring of 2011, soil herbicide concentrations had dissipated and Spanish needles had begun to reinfest the site. On 4/15/11, and additional application of aminopyralid and triclopyr amine was made. This treatment controlled 100% of all existing weeds and provided sufficient soil activity to maintain the site weed-free through October 2011. While the broadleaf weeds were controlled, the desirable perennial grasses were observed to spread and begin covering these void areas. By September 2011, the treated sites were approximately 70% covered with either bermudagrass or bahiagrass. The remaining 30% of the area was filled with crowfootgrass (*Dactyloctenium aegyptium*) and maidencane (*Panicum hemitomon*). Neither of these species are currently considered to be desirable grasses. Crowfootgrass is low-growing species (similar in appearance to crabgrass) that is not a concern for line of sight or driver safety. However, this is an annual species that will die at the end of each season. For this reason it is considered to be non-desirable. Conversely, maidencane is a perennial species that forms a dense root system that will sufficiently stabilize soil. Though maidencane has the potential to reach excessive heights, it rarely grows more than 2' in height in right-of-way environments. Based on these characteristics, I believe that it is an acceptable replacement for broadleaf weeds.

Hardee County

Bahiagrass was the predominant perennial grass species at the Hardee County location. Spanish needles was the most predominant broadleaf weed, covering approximately 95% of the area. Other minor broadleaf weed species included teaweed (*Sida* sp.), matchweed, and very little pusley (*Richardia* sp.). The desirable grass, bahiagrass, covered approximately 60-70% of the area.

After the application on 9/20/10, percent cover of all weedy species, except for teaweeds, was reduced to <5%. Since this application was very late during the year, little emergence of Spanish needles occurred following treatment until the following spring. Frost was prevalent in south Florida during the winter months of 2010, with frost events occurring in early November; frost usually occurs in February. This frost induced dormancy allowed winter weed growth (cutleaf geranium, oldfield toadflax, pepperweed), however, these species generally do not impact motorist safety.

In the spring of 2011, winter weed growth and Spanish needle regrowth (from seedlings) had begun reinfesting the site. The sequential treatment mentioned above controlled the existing winter annuals as well as the new Spanish needles. Teaweed species were not effectively controlled by the two applications, which is not uncommon as most herbicides are only a temporary fix for teaweed species. To date, bahiagrass ground cover has increased to 70-80% in the treated areas, showing value for herbicide applications to decrease undesirables and increase desirable species (Images 1-3).

According to Tim Allen, State MRP Coordinator, the presence of broadleaf weeds is one of the primary reasons why districts fail to meet MRP standards. Accordingly, the two sites selected for this work would have failed to meet these standards (Images 1 and 2) and the presence of the untreated areas adjacent to the plots served as proof of this fact. However, after the herbicide applications were made and the broadleaf weeds were controlled, the treated areas were brought into compliance with MRP standards.

CONCLUSION

Based on this work, it possible to take right-of-way areas that are infested with broadleaf weeds and bring them into compliance with herbicide applications. For the sites in this experiment, this was done at a herbicide cost of approximately $22 per acre. Although it was beyond the scope of this project, it is likely that repeat applications occurring annually for 2-4 years would improve turf quality while also reducing soil weed seed bank to a level that yearly herbicide applications were no longer necessary.

This research project was conducted by Jason Ferrell, Ph.D. and Brent Sellers, Ph. D. of the University of Florida, IFAS. For more information, contact Tim Allen, Project Manager at (850) 410-5633, Tim.Allen@dot.state.fl.us

Image 1 and 2. Roadside prior to treatment. Hardee County

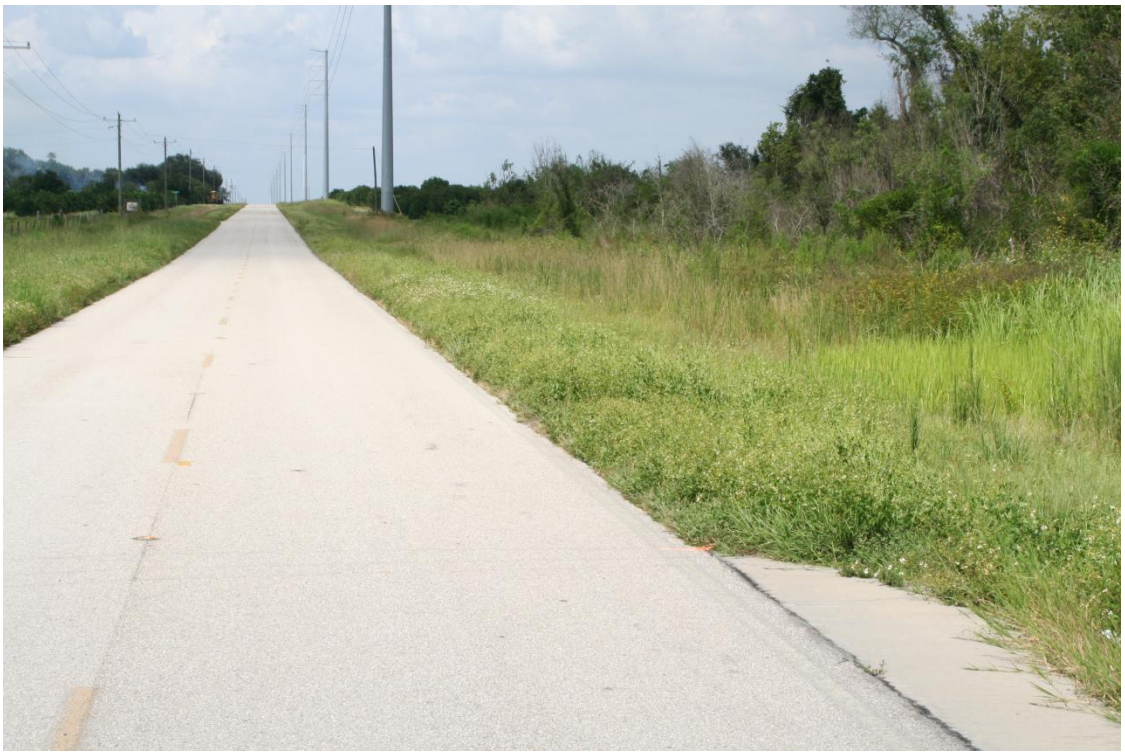

Image 3. Roadside at conclusion of project. Hardee County.